

BEST AVAILABLE COPY**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

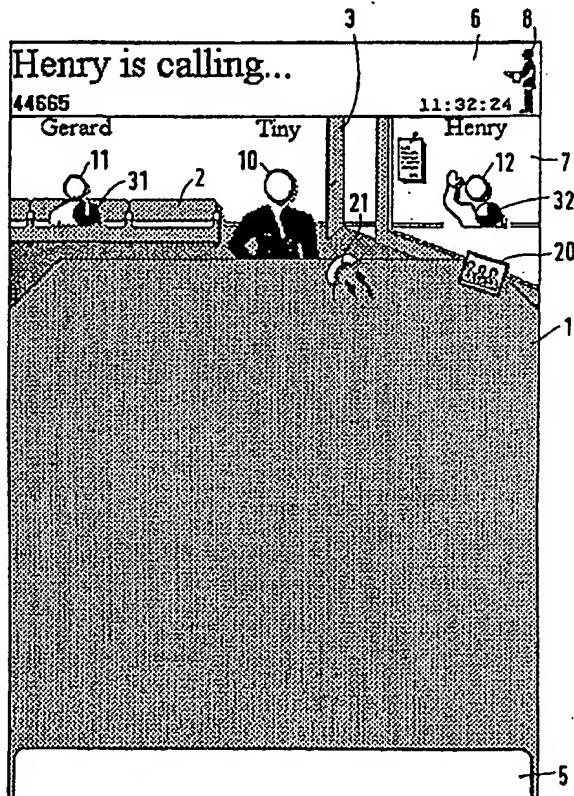
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ :	A2	(11) International Publication Number: WO 97/08879
H04M 1/02, 1/274, 3/42		(43) International Publication Date: 6 March 1997 (06.03.97)
(21) International Application Number: PCT/IB96/00841		(81) Designated States: CA, JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
(22) International Filing Date: 26 August 1996 (26.08.96)		
(30) Priority Data: 95202348.9 31 August 1995 (31.08.95) EP		Published <i>Without international search report and to be republished upon receipt of that report.</i>
(34) Countries for which the regional or international application was filed: NL et al.		
(71) Applicant: PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).		
(71) Applicant (for SE only): PHILIPS NORDEN AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE).		
(72) Inventors: WEISHUT, Gideon, Martin, Reinier; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL). VAN OOSTERHOUT, Mascha, Maria, Christina, Cornelia; Patrijzenhof 74, NL-3755 ET Eemnes (NL). SLEGRS, Walter, Jeroen; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).		
(74) Agent: MAK, Theodorus, N.; Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).		

(54) Title: TERMINAL

(57) Abstract

A terminal, for use in a communication system is described having graphical representation means and displaying means for displaying icons on the graphical representation means, the icons representing parties having calls with the terminal. For representing parties in different call states, like an incoming call state, a connected call state or an on-hold call state, icons are used which differ in size and/or shape. This makes it possible for a user to read at a glance the state of all calls of the terminal.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

Terminal

The invention relates to a terminal for use in a communication system, the terminal comprising graphical representation means, display means for displaying icons on the graphical representation means.

5

A terminal according to the preamble is known from US-patent 4,653,0-90. An icon is a small pictorial representation of some larger set of information, that is accessed or operated upon through actuation of the icon. Icons have turned out to be useful tools, designed to trigger within the mind of the human through visual perception, user 10 concepts that quickly communicate the contents or operation of an apparatus or system. The icons used in the terminal described in the cited patent are small telephones with the name of the corresponding party written near them. The icons are shown in so called call appearance boxes. The call appearance boxes are representative for calls between the parties corresponding to the icons shown in the call appearance boxes. The state of the call represented by 15 the call appearance box, incoming, active or on-hold is indicated by the colour of the icons in that box. The icons can be inserted into the boxes, moved between the boxes or moved from the boxes, this resulting respectively in adding the corresponding parties to calls, moving them between calls or releasing them from calls. By mouse clicking within a call appearance box the call between the parties of which the icons are shown in that box is 20 brought into the active call state, thereby automatically bringing the calls of all other call appearance boxes in the on-hold state. This means that the active call can be represented in any of the call appearance boxes.

Because of the fact that the active call can be represented in any of the call appearance boxes, the user needs to discriminate between the colours of the icons in 25 each call appearance box, in order to find out which of the boxes comprises the active call. This can be difficult, especially due to sun light or artificial light entering on the graphical representation means. Furthermore the user needs to learn by which specific colours the variuos known call states are indicated and of course this known terminal is surely not appropriate for use by colour blind persons.

It is an object of the invention to improve the representation of call states, so as to enhance the recognizability thereof.

5

Thereto a terminal according to the preamble is characterized in that, the display means are arranged for using icons with different sizes and/or shapes to represent parties in different call states. This leads thereto that even when sun light or artificial light enters on the graphical representation means the user can discriminate between the different

10 call states.

An embodiment of the terminal according to the invention is characterized in that, the display means are arranged for displaying the icons on different fixed locations of the graphical representation means to represent the parties in different call states. This leads thereto that the discrimination between the call states is even easier, since icons representing

15 parties in a certain call state are always shown on the same fixed location.

A further embodiment of the terminal according to the invention is characterized in that, the display means are arranged to discriminate between an incoming call state, a connected call state and an on-hold call state of the parties. These call states are the most important call states for the user to know. Discriminating between more call states

20 would unnecessarily complicate the use of the terminal by the user.

A further embodiment of the terminal according to the invention is characterized in that, the icons are figurines. Figurines are defined as icons represented in the form of persons. Using figurines for representing the parties with which the terminal has calls, is very intuitive and natural for the user, since a party normally is a person.

25 A further embodiment of the terminal according to the invention is characterized in that, when a party is in the incoming call state, the display means are arranged to represent the party by a figurine, which is waving. Since waving people just like incoming calls want attention, this representation is a very natural one.

A further embodiment of the terminal according to the invention is 30 characterized in that, when a party is in the connected call state the display means are arranged to represent the party by a figurine, which is standing in front of a desk. Such a figurine, especially when it is shown bigger than other figurines, is a logic representation of the connected call state.

A further embodiment of the terminal according to the invention is

characterized in that, when a party is in the on-hold call state the display means are arranged to represent the party by a figurine, which is sitting on a couch. Parties in the on-hold state are waiting for the user to carry out an action on them, like connecting them or transferring them to another terminal. Representing those parties by figurines sitting on a couch is very 5 intuitive and natural, because waiting in every day life frequently takes place sitting on a couch.

A further embodiment of the terminal according to the invention is characterized in that, the terminal comprises control means for controlling calls with the parties by exchanging signalling messages with the communication network and actuating 10 means for actuation of icons on the graphical representation means thereby initiating changes in the state of the terminal, whereby the control means are arranged to send appropriate signalling messages to the communication network upon actuation of icons. So, by actuating i.e. selecting or moving of the icons the user can easily handle calls.

A further embodiment of the terminal according to the invention is 15 characterized in that, the control means are arranged for setting up a conference call between the terminal, a first and a second party, when an icon representative for a conference call is selected by the actuating means, the first party is in the connected call state and the second party is in the on-hold call state and selected by the actuating means. So, when the user presently has a connected call with a first party and wants to set up a conference call, he 20 only has to carry out two actions: selecting the conference call icon and selecting a second party in the on-hold state, which party is to be included in the conference call.

A further embodiment of the terminal according to the invention is characterized in that, the control means are arranged for carrying out a call transfer between a first party and a second party, when the first party is in the connected call state and 25 selected by the handling means and the second party is in the on-hold call state and selected by the handling means. So transferring of a call only needs two user actions.

A further embodiment of the terminal according to the invention is characterized in that, when an icon representative for call blocking is selected the control means are arranged for blocking incoming calls. Blocking calls by selecting an icon is more 30 pleasant for a user than by buttons, as was done in telephones up till now.

A further embodiment of the terminal according to the invention is characterized in that, the icon representative for call blocking is a door, which is closed when call blocking is selected and open when call blocking is not selected. The use of this icon gives a very natural indication, whether the blocking calls function has

been selected or not.

A further embodiment of the terminal according to the invention is characterized in that, the displaying means are arranged for representing call states of other terminals in the communication system by icons. In this way the user of the terminal is 5 informed about the call states in a more direct way than by LEDs, which are normally used for this purpose.

A further embodiment of the terminal according to the invention is characterized in that, the display means are arranged for displaying an absent/present icon in the form of a light switch, and in that when the light switch is selected at least part of the 10 graphical representation means is dark.

So, the user can indicate his absence/presence in a very natural way, by "turning on" or "turning off the light", just like he does at home or in the office.

A further embodiment of the terminal according to the invention is characterized in that, the displaying means are arranged for displaying absence of users of 15 other terminals in the communication system. So, the user immediately knows if users of other terminals are absent or not, thereby avoiding a waste of time trying to call them, when they are not there.

A further embodiment of the terminal according to the invention is characterized in that, the displaying means are arranged to change the icons representing 20 parties, which put the terminal on hold. Such a change makes it visible to the user of the terminal, if he is put on hold by other parties or not. The time that he is put on hold by the other party, he can put this party on hold, also. He can then do other things, like making a new call.

25

The present invention will become more clear in conjunction with the accompanying figures of which:

figure 1 is a block diagram of a communication system,

figure 2a and 2b are block diagrams of terminals for use in a communica-
30 tion system, and

figure 3-11 are graphical representations of various states of the terminal.

In the figures identical parts are provided with the same reference numbers.

In figure 1 a block diagram is shown of a communication system CS consisting of a communication network CN and a number of terminals TE connected to the network. The communication network is here shown as consisting of two private telephone exchanges PBX1 and PBX2 but can of course be in every other known form.

5 Figures 2a and 2b show block diagrams of two terminals TE according to the invention. The terminal of figure 2a consists of a relatively simple telephone set TL, of which only the control means are shown and a PC-configuration coupled thereto. The PC-configuration is formed by a computer CP, a keyboard KB, a monitor MO and a mouse MS. The computer and the telephone are coupled via a suitable interface, for example a RS232-
10 interface. The terminal of figure 2b consists of a more enhanced telephone set comprising a touch screen TS and a pen PN for giving user commands via the touch screen.

The control means of both terminals are in a known way arranged for controlling calls between the terminal and further terminals connected to the communication network. They thereto exchange signalling messages MSG with the communication network.
15 In both terminals the call states of calls with other terminals are represented on the monitor MO or touch screen TS, respectively. Thereto appropriate software is present, translating incoming signalling messages in changes of call states and thus also in changes in the representation. The representation of calls is given in the form of icons. By selecting and manipulating the icons by use of the keyboard, the mouse or by touching the touch screen
20 with the pen PN, or even a finger the user can manipulate the calls. Thereto appropriate software is present translating such manipulations in signalling messages, which are sent to the communication network and also changing the representation of the calls accordingly. In the terminal according to figure 2a the software can be divided over the computer and the control means in the telephone. In the terminal according to figure 2b all the software is
25 present in the control means in the telephone itself.

Figure 3 shows the representation given, when the terminal is in an idle state, so when no calls are present. The semaphore, which is used is an office. Such an office semaphore is very useful, when the terminal is a business telephone, because an office is the every day environment of the user of such a business telephone. The office comprises
30 a desk 1, a couch 2, a door 3 and a light switch 4, which are all features present in almost every office. Through a window a corridor 7 can be seen. There are also a bar 5 at the bottom of the presentation, which comprises a number of icons relating to functions of the terminal. The bar at the top 6 is arranged for displaying in the form of text, useful information for the user. Figure 4 shows the representation, when there are calls. The icon 10 which

is represented in front of the desk 1 is representative for the party with whom the user has a connected call. The icon has the form of a figurine. Figurines are defined to be icons represented in the form of persons. This appears to be a very natural representation, because the party, which the figurine represents normally is a person. Another figurine 11, sitting on the couch represents a party of which the call has been set on-hold. On-hold parties are waiting for the user to carry out an action on them, like connecting them or transferring them to another terminal. Representing those parties by figurines sitting on a couch is very intuitive and natural, because waiting in every day life frequently takes place sitting. Another figurine 12 waving in the corridor is representative for a party of whom the call is in the incoming call state. This means that, that party is trying to reach the user of the terminal but the user has not answered, yet. Waving is a way to ask for attention. Since the incoming call needs the attention of the user, this way of representing is very natural. Also the position of the figurine 12 in the corridor, so outside the office, triggers the user immediately to the fact that this call has not been answered, yet. All the figurines representative for parties in a certain call state are always represented in the same way and at the same position. So, calls in the on-hold state are represented sitting on the couch, connected calls are represented standing in front of the desk and incoming calls are represented waving in the corridor. In this way the user at a glance sees the situation of all the calls, he is dealing with. When the terminal knows the name of a party, this name is displayed near the corresponding icon.

Otherwise the number of the party, which in ISDN-systems is always sent during the initial phase of a call, is shown. It is possible that more incoming calls or calls in the on-hold state are present. The figurines representing parties in these call states are shown together in the corridor or on the couch. When a party is set on the couch, the couch rolls into the office creating an empty seat for a new party to be set on the couch. Near the parties in the on-hold call state or the incoming call state small clocks 31 32 are shown. These clocks are gradually filled every few seconds. In this way it can approximately be seen how long the corresponding parties are in the incoming state or on-hold state, respectively and which one of a number of parties is in a certain state the longest.

The user can manipulate calls by actuating of icons. The user can put a connected party on-hold by tapping the figurine representing that party and then tapping the couch. The party is then represented by a figurine sitting on the couch. Putting a party, which is in the on-hold state, into the connected state can simply be done by tapping the figurine sitting on the couch representing this party. If there already is a party in the connected state, this party is put in the on-hold state, automatically. This is represented by

letting the figurines representing the parties change places between the desk and the couch. A call transfer can be realised by first tapping a party in the connected state and then tapping a party in the on-hold state, as a result of which those two parties will be connected.

5 The upper bar 6 comprises an icon 8 in the form of a butler. By clicking this icon the user can get access to a number of options. One of the options is to put some more icons on the desk 1, like a family photo 20, which represents the possibility to make a conference call or a telephone receiver 21, which represents the possibility to force an on- or off hook signal. Whenever the user wants, he can select those icons for setting up a conference call or forcing an on- or off hook signal, respectively.

10 Figure 5 shows how the user can activate the call blocking feature and how this is shown. The call blocking feature is selected simply by selecting the icon 3 in the form of a door, which results in this door being closed. A slam is heard, when the door is closed. When the user wants he can fill out a note, stating what the terminal has to do with incoming calls, if they have to be diverted to other numbers or if some very specific calls 15 even during the call blocking state are to be received, etc. When he has filled out this note, it is put in a smaller form near the door (icon 40), thereby indicating that the user has left instructions to the terminal about the treatment of incoming calls. Representing the call blocking state, by a closed door appears to be very natural, since people in an office, generally close their doors, when they do not want to be disturbed and leave them open when 20 they do not have a problem in being disturbed.

Figure 6 shows how the user can indicate, if he is absent or not and how the absent state is indicated. The user simply indicates his absence/presence by switching the light switch 4. Absence is represented by a dark office as shown in the figure, while presence is represented by an illuminated office, just like in every day life. The control 25 means are arranged for communicating the absence of the user of the terminal to other terminals, the users of those terminals thereby being informed of the absence of the user.

Figure 7 shows what happens when the terminal is put on hold by another party. The icon representing this party is then changed to give the user a visual indication, that he is put on hold by the other party. The change shown in figure 7 exists in showing a 30 figurine, which has turned his back on the user. During the time that he is put on-hold by the other party, he can do other things like parking the party as well, this resulting in a figurine sitting on the couch 2, still turning his back on the user, and then making a new call. When the other party ends the on-hold situation the figurine representing it is shown in front view, again. The user can then connect this party again and continue the conversation.

FIGURE 8 and 9 show how a conference call is to be set up and how it is represented. When a user want to set up a conference call, he has to assure that he has one party in a connected call state and another party in an on-hold call state (figure 8, figurine 10 and 11). He then has to tap the icon representative for conference calls 20 and then simply 5 select the figurine sitting on the couch 11. This results in a conference call between the user and those two parties. The representation of this state is shown in figure 9, in which two figurines 10 are standing before the desk.

Figure 10 shows how dialling takes place. In order to dial a number the user selects an icon in the lower bar 5, named keypad 50. This results in a window being 10 shown over a part of the desk, this window showing a standard telephone keypad. By simply selecting the right digits the user can dial a number of a party to be called. By selecting the keypad icon 50 again, the keypad window disappears.

Other icons are present in the lower bar 5, like a speed dial icon. This icon results in a window being displayed, comprising names of parties whose numbers are 15 preprogrammed in the terminal. By simply selecting a name, the user can make the terminal dialling the corresponding number.

The lower bar 5 also comprises a group icon 51. Selecting this icon results in a window being displayed over part of the desk comprising a group sheet 510. This is shown in figure 11. The group sheet shows the state of a number of other terminals 20 connected to the communication network, together forming the group. Monitoring of group members is well known in state of the art communication systems. In terminals like the business phone of Philips Sopho-set S375(D), having the possibility to monitor the states of members of a group, this monitoring is done by use of LEDs. In the terminal according to the present invention, however icons are used, as shown in figure 11. An absent group 25 member is represented by an empty room 510, A group member, who does not want to be disturbed is represented by a closed door with a note 511, a group member who is dialling is represented by a calling figurine 512, a group member who has a call in the connected state is represented by a calling figurine with a text balloon 513 and a group member who is present and in the idle state is represented by a figurine seen from beside 514. The group 30 sheet gives the user at a glance the states of all his group members. Furthermore an idle group member can be called in a very simple way by just selecting the icon representing him. This can be done even while a party in the connected call state is present. When the group member is called, this party is put on-hold automatically.

The embodiments of the present invention described herein are intended to

be taken in an illustrative sense and not in a limiting sense. Various modifications may be made to these embodiments by persons skilled in the art without departing from the scope of the present invention as defined in the appended claims.

CLAIMS:

1. Terminal for use in a communication system, the terminal comprising graphical representation means, display means for displaying icons on the graphical representation means, characterized in that, the display means are arranged for using icons with different sizes and/or shapes to represent parties in different call states.
- 5 2. Terminal according to claim 1 characterized in that, the display means are arranged for displaying the icons on different fixed locations of the graphical representation means to represent the parties in different call states.
3. Terminal according to claim 1 or 2 characterized in that, the display means are arranged to discriminate between an incoming call state, a connected call state and
- 10 10 an on-hold call state of the parties.
4. Terminal according to claim 3 characterized in that, the icons are figurines (icons of persons).
5. Terminal according to claim 4 characterized in that, when a party is in the incoming call state, the display means are arranged to represent the party by a figurine, which is waving.
- 15 6. Terminal according to claim 4 or 5 characterized in that, when a party is in the connected call state the display means are arranged to represent the party by a figurine, which is standing in front of a desk.
7. Terminal according to claim 4, 5 or 6 characterized in that, when a party
- 20 20 is in the on-hold call state the display means are arranged to represent the party by a figurine, which is sitting on a couch.
8. Terminal according to one of the claims 3 to 7, characterized in that the terminal comprises control means for controlling calls with the parties by exchanging signalling messages with the communication network and actuating means for actuation of
- 25 25 icons on the graphical representation means thereby initiating changes in the state of the terminal, whereby the control means are arranged to send appropriate signalling messages to the communication network upon actuation of icons.
9. Terminal according to claim 8, characterized in that the control means are arranged for setting up a conference call between the terminal, a first and a second party,

when an icon representative for a conference call is selected by the actuating means, the first party is in the connected call state and the second party is in the on-hold call state and selected by the actuating means.

10. Terminal according to claim 8, characterized in that the control means are 5 arranged for carrying out a call transfer between a first party and a second party, when the first party is in the connected call state and selected by the actuating means and the second party is in the on-hold call state and selected by the actuating means.

11. Terminal according to claim 8, 9 or 10 characterized in that, when an icon representative for call blocking is selected the control means are arranged for blocking 10 incoming calls.

12. Terminal according to claim 11, characterized in that, the icon representative for call blocking is a door, which is closed when call blocking is selected and open when call blocking is not selected.

13. Terminal according to one of the preceding claims characterized in that, 15 the displaying means are arranged for representing call states of other terminals in the communication system by icons.

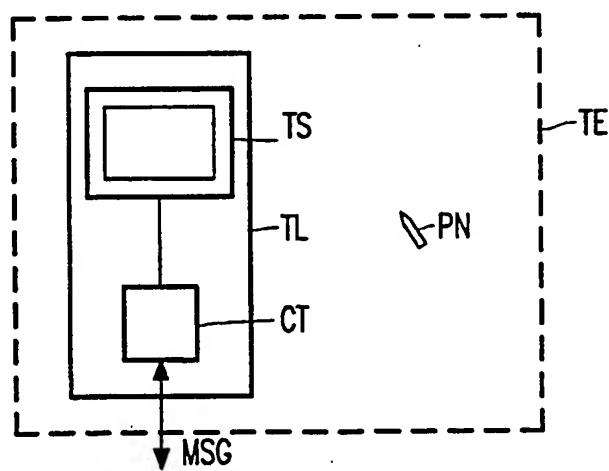
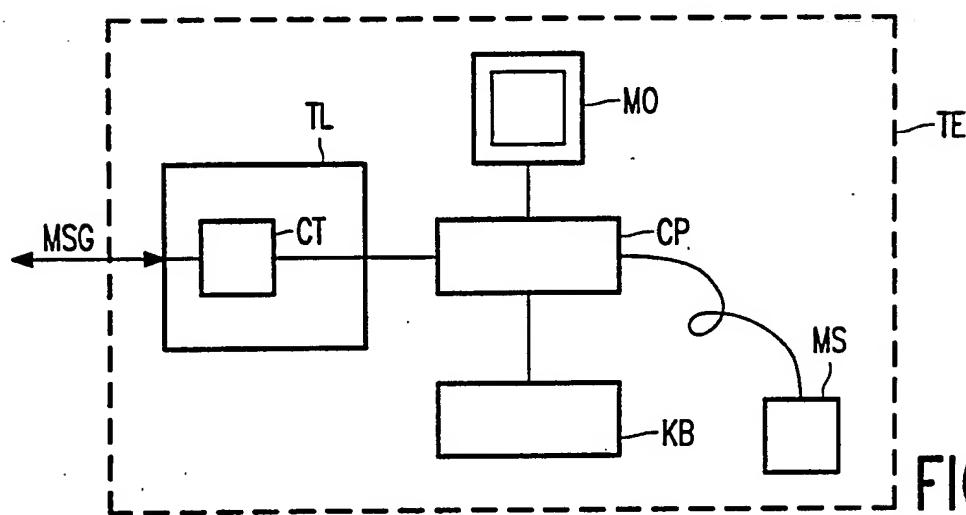
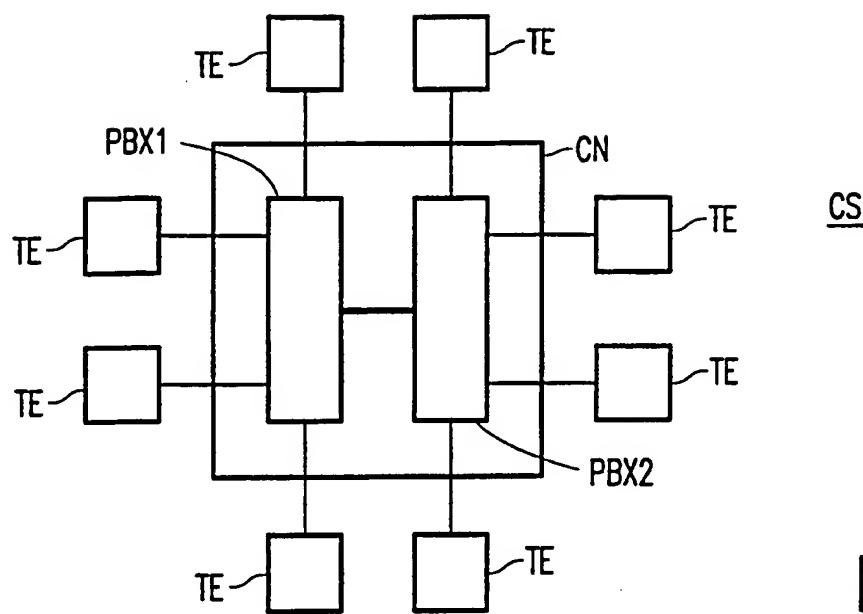
14. Terminal according to claim 13, characterized in that, the display means are arranged for displaying an absent/present icon in the form of a light switch, and in that when the light switch is selected at least part of the graphical representation means is dark.

20 15. Terminal according to claim 14, characterized in that the displaying means are arranged for displaying absence of users of other terminals in the communication system.

16. Terminal according to one of the preceding claims, characterized in that the displaying means are arranged to change the icons representing parties, which put the terminal on- hold.

25 17. Communication system having a terminal comprising graphical representation means, display means for displaying icons on the graphical representation means, characterized in that, the display means are arranged for using icons with different sizes and/or shapes to represent parties in different call states.

1/10



2/10

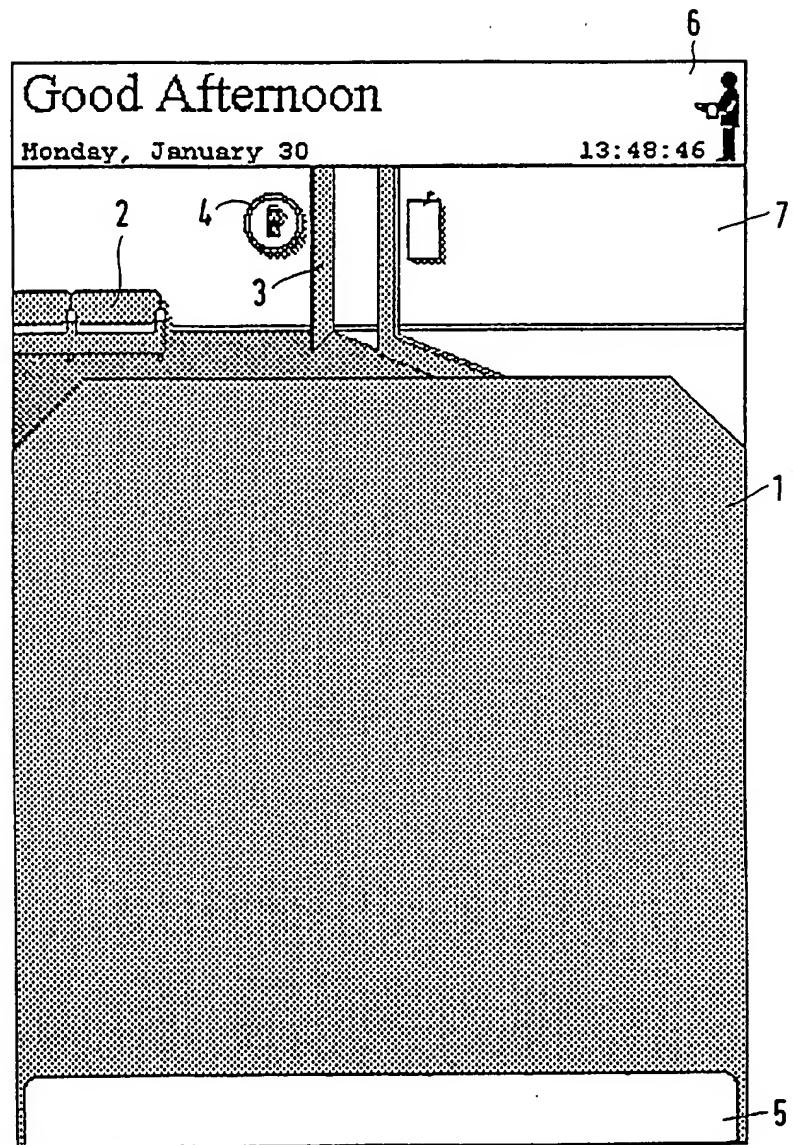


FIG.3

3/10

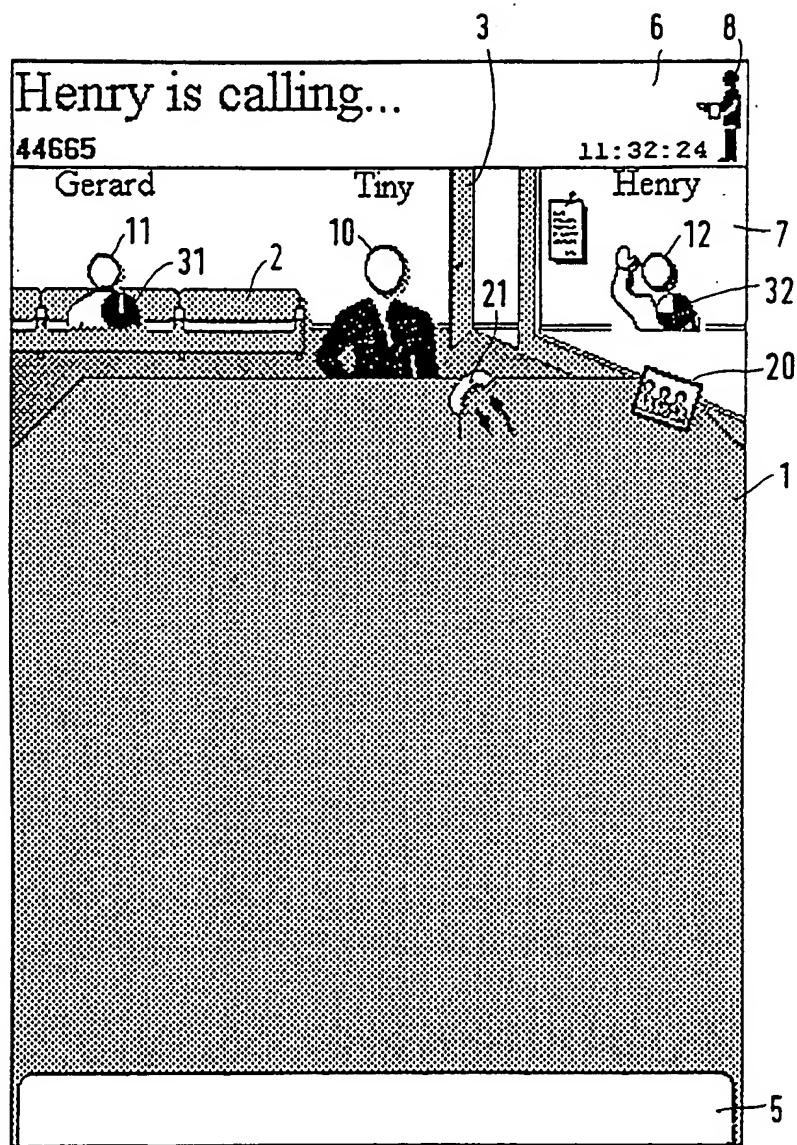


FIG. 4

4/10

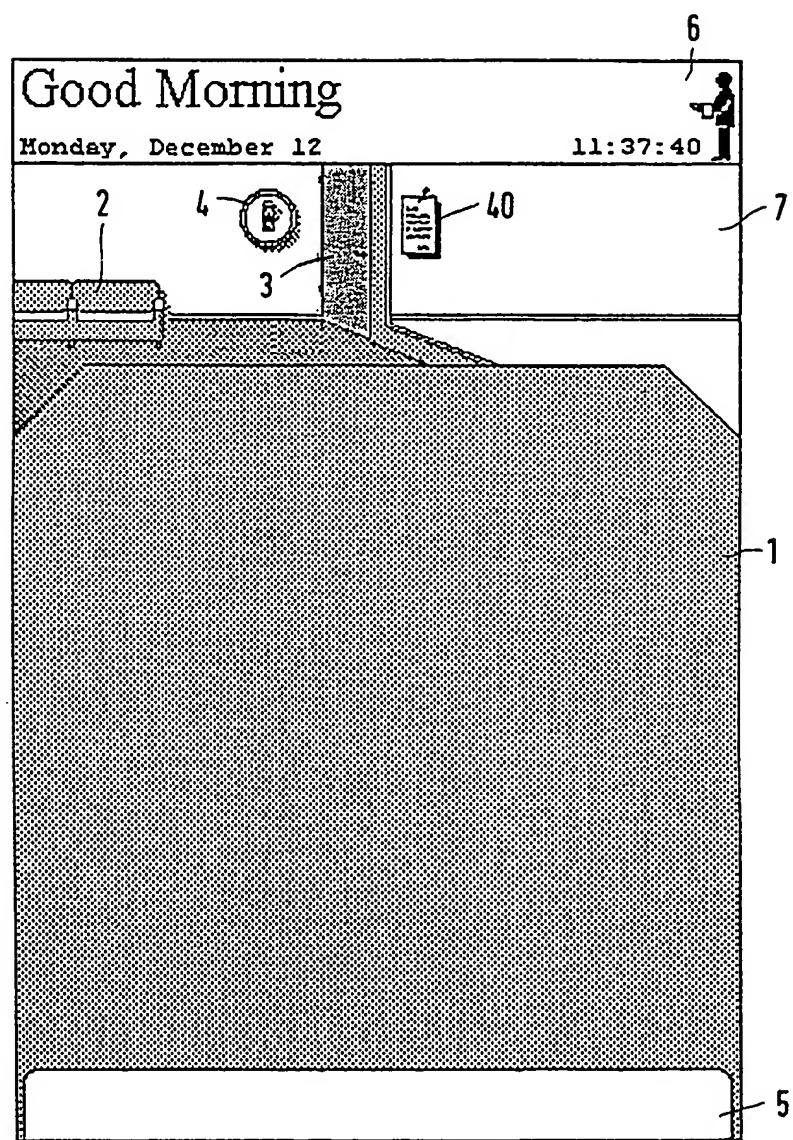


FIG. 5

5/10

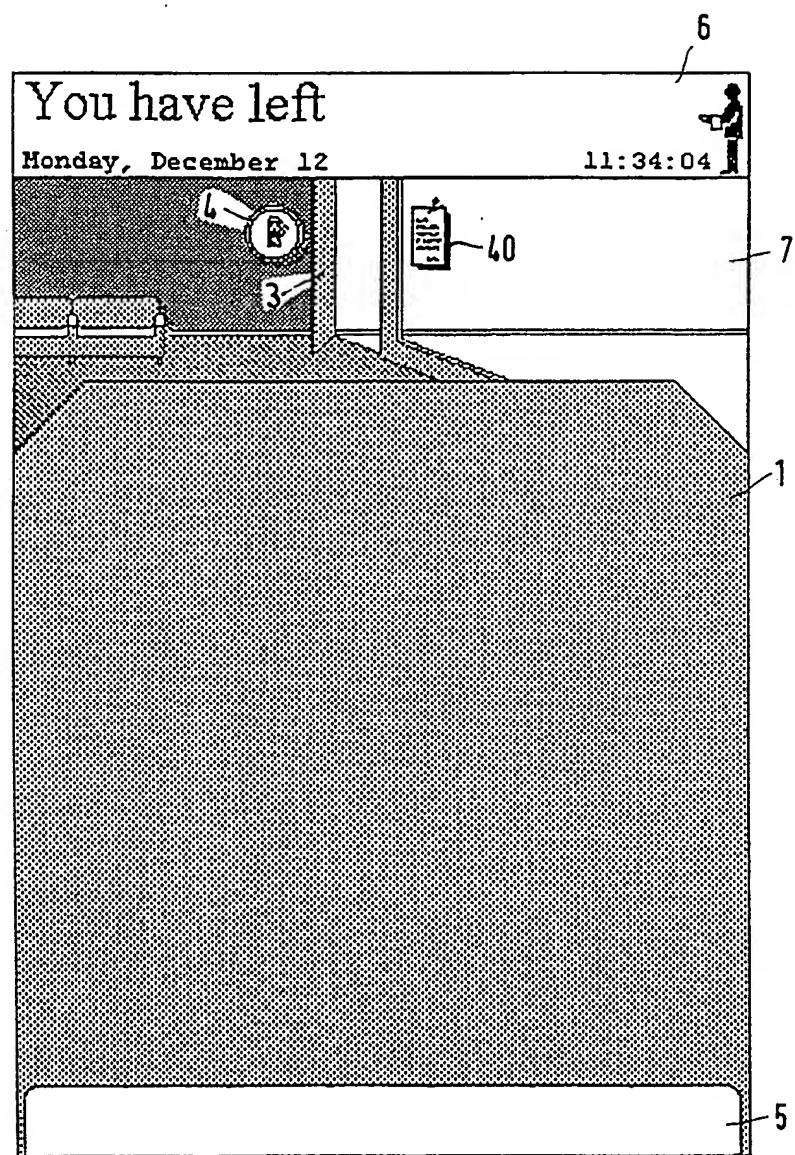


FIG. 6

6/10

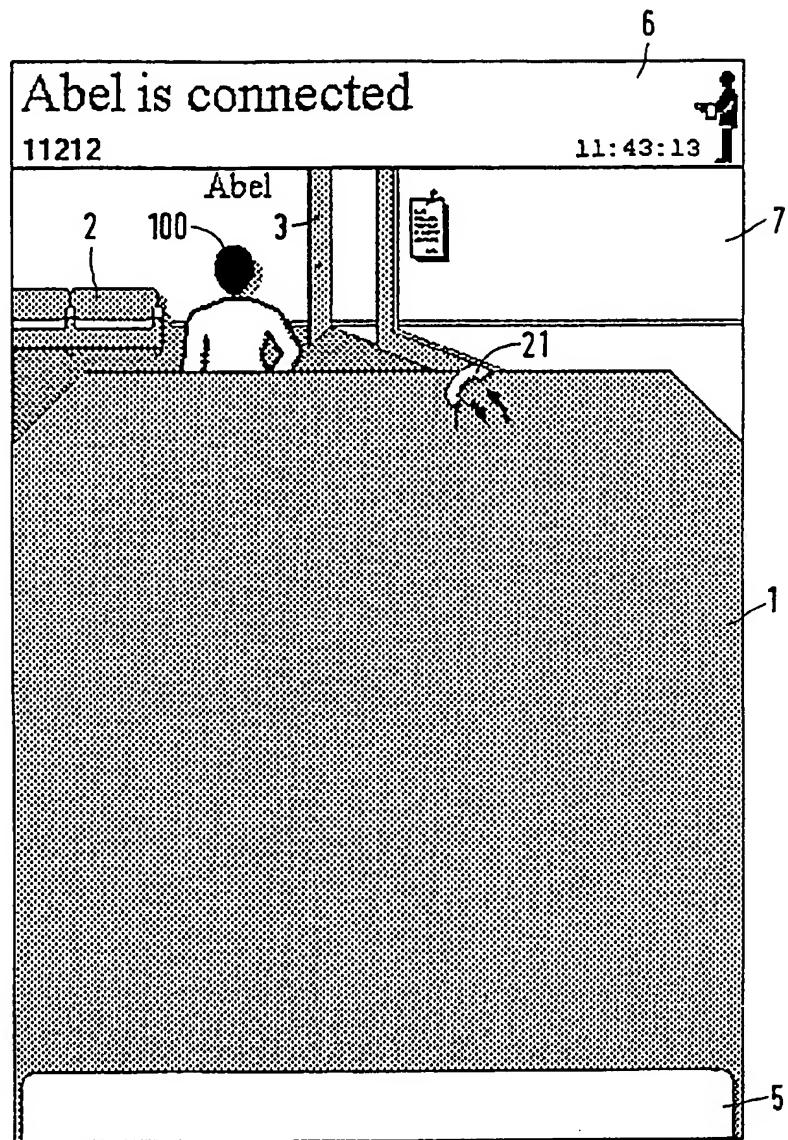


FIG. 7

7/10

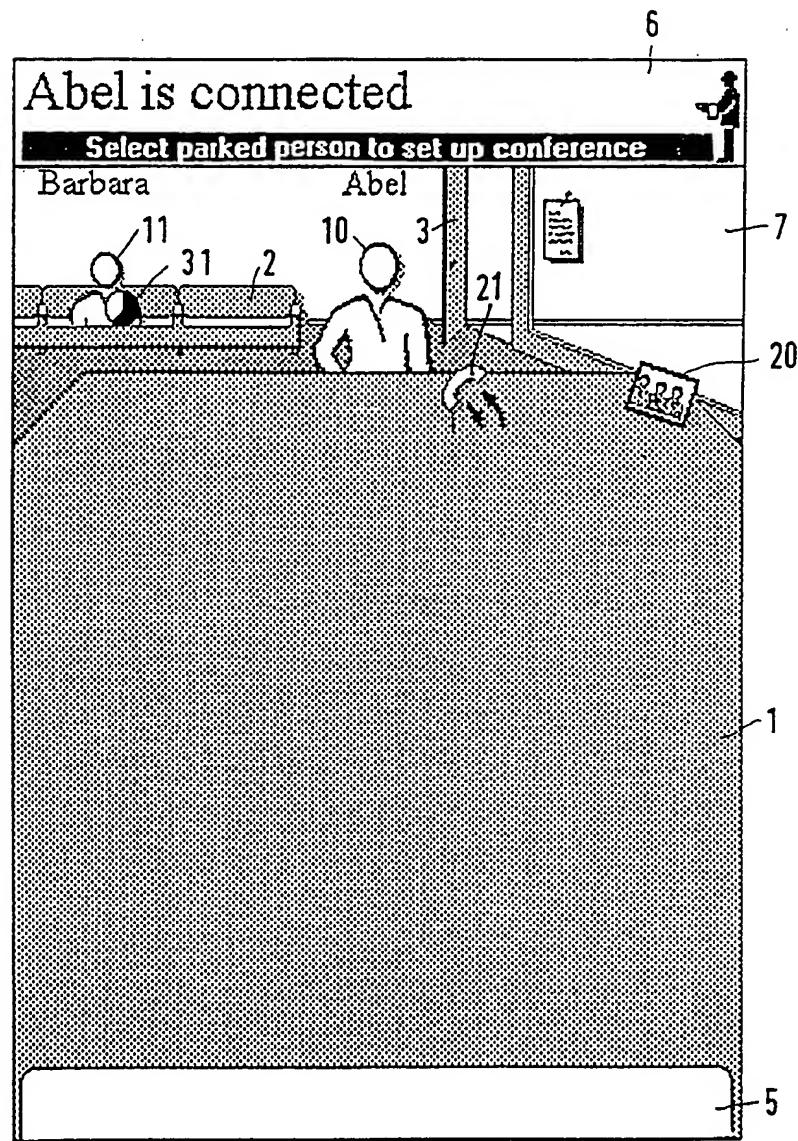


FIG.8

8/10

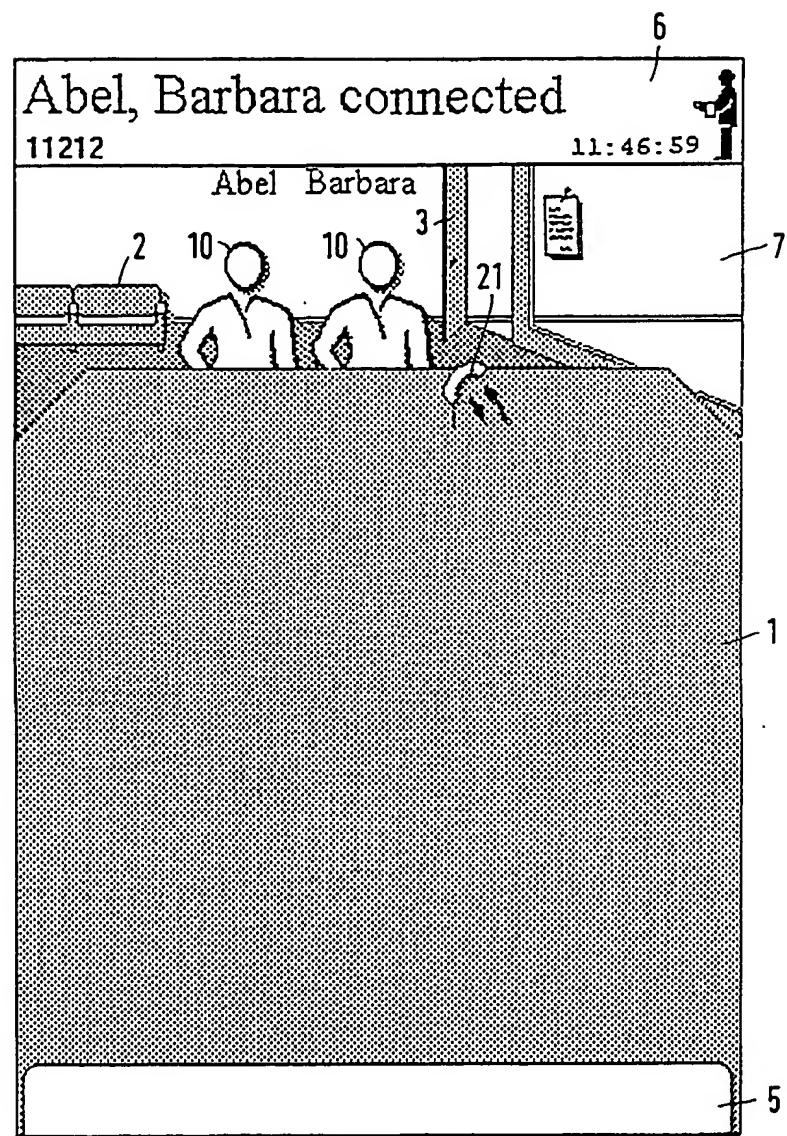


FIG.9

9/10

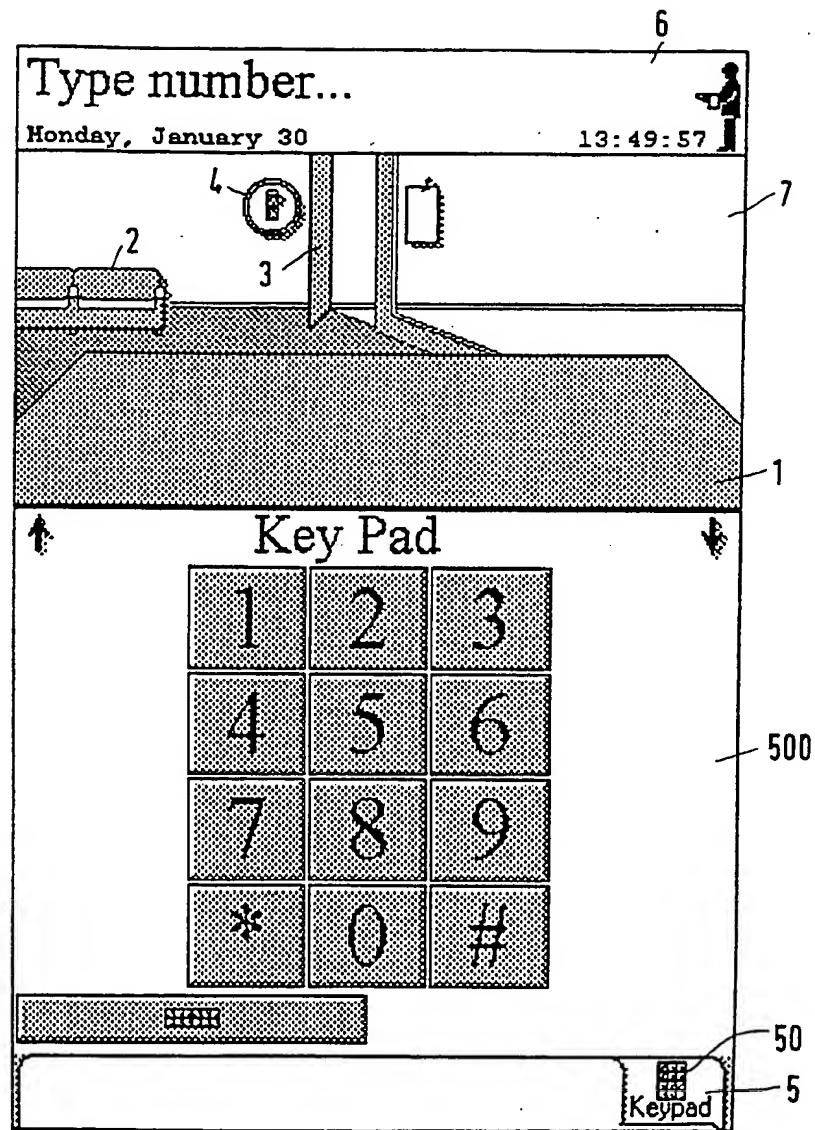


FIG. 10

10/10

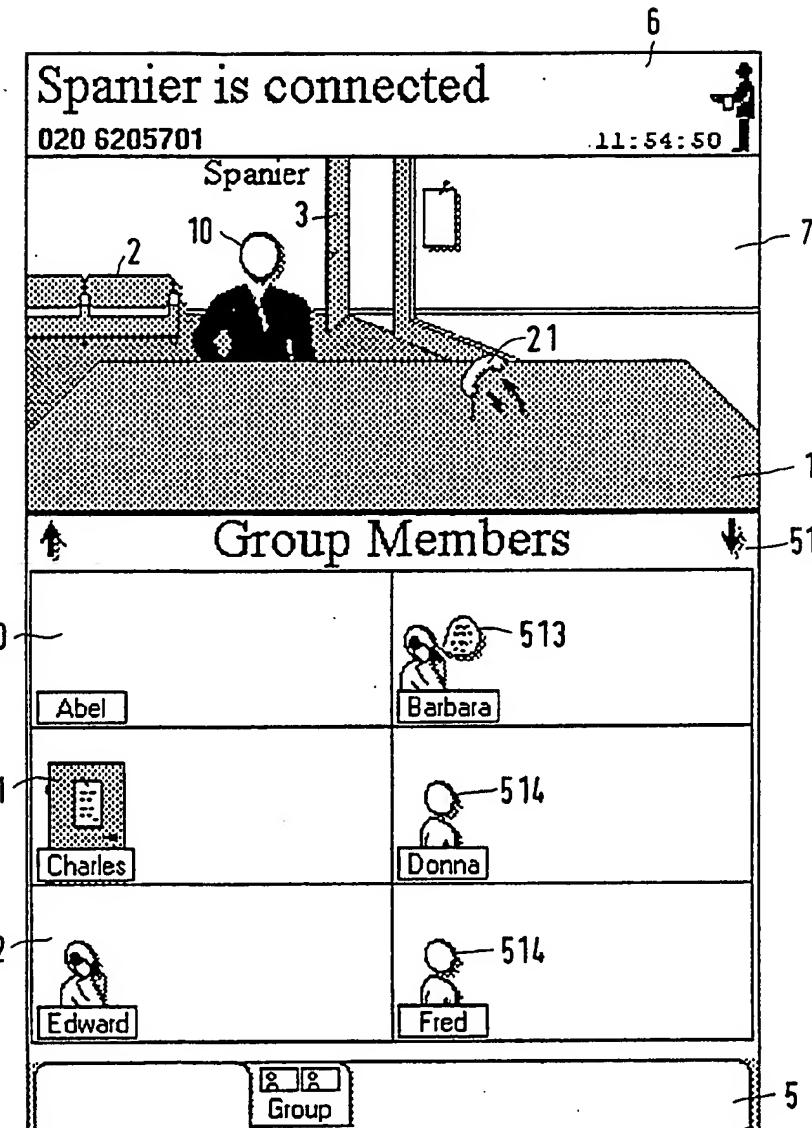


FIG. 11



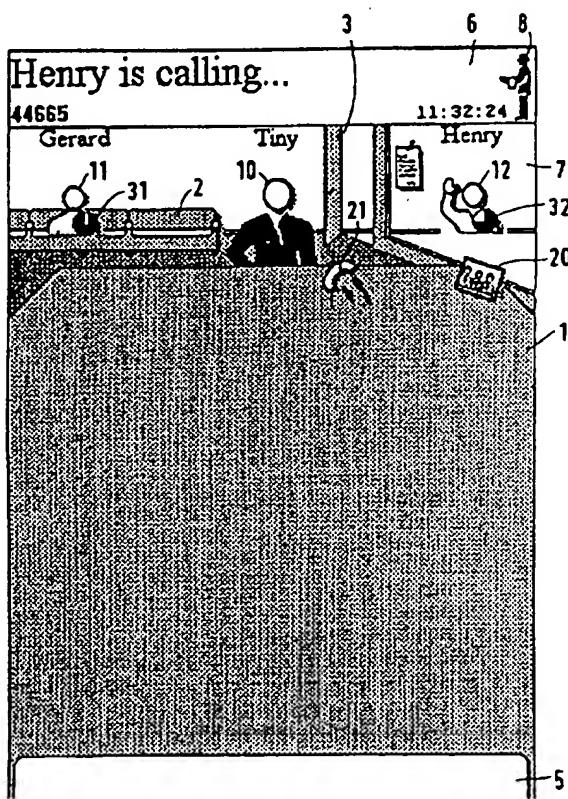
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04M 1/02, 1/274, 3/42		A3	(11) International Publication Number: WO 97/08879
			(43) International Publication Date: 6 March 1997 (06.03.97)
(21) International Application Number: PCT/IB96/00841		(81) Designated States: CA, JP, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 26 August 1996 (26.08.96)		Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(30) Priority Data: 95202348.9 31 August 1995 (31.08.95) EP (34) Countries for which the regional or international application was filed: NL et al.		(88) Date of publication of the international search report: 10 April 1997 (10.04.97)	
(71) Applicant: PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).			
(71) Applicant (for SE only): PHILIPS NORDEN AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE).			
(72) Inventors: WEISHUT, Gideon, Martin, Reinier, Groenewoudseweg 1, NL-5621 BA Eindhoven (NL). VAN OOSTERHOUT, Mascha, Maria, Christina, Cornelia; Patrijzenhof 74, NL-3755 ET Eemnes (NL). SLEGRS, Walter, Jeroen; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).			
(74) Agent: MAK, Theodorus, N.; Internationaal Octrooibureau B.V., P.O. Box 220, NL-5600 AE Eindhoven (NL).			

(54) Title: TERMINAL

(57) Abstract

A terminal, for use in a communication system is described having graphical representation means and displaying means for displaying icons on the graphical representation means, the icons representing parties having calls with the terminal. For representing parties in different call states, like an incoming call state, a connected call state or an on-hold call state, icons are used which differ in size and/or shape. This makes it possible for a user to read at a glance the state of all calls of the terminal.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 96/00841

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04M 1/02, H04M 1/274, H04M 3/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2276520 A (U S WEST ADVANCED TECHNOLOGIES INC), 28 Sept 1994 (28.09.94), page 5, line 1 - page 37, line 15, figures 1-17, abstract --	1-17
Y	FI 88348 B (TELENOKIA OY), 19 November 1991 (19.11.91), figure 2, claims 1-5, abstract --	1-17
Y	US 4653090 A (HAYDEN), 24 March 1987 (24.03.87), column 4, line 5 - column 7, line 42, figures 2-18, abstract --	1-17

 Further documents are listed in the continuation of Box C. See patent family annex.

- * Special categories of cited documents
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed
- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 February 1997	24 -02- 1997
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Authorized officer Roland Landström Telephone No. + 46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB 96/00841

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>EP 0602840 A1 (AT & T CORP.), 2 December 1993 (02.12.93), column 3, line 7 - line 43, figure 1, abstract</p> <p>-- -----</p>	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB 96/00841

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
GB-A- 2276520	28/09/94	GB-D-	9405652	00/00/00
FI-B- 88348	19/11/91	NONE		
US-A- 4653090	24/03/87	AU-B- AU-A- CA-A- DE-D,T- EP-A,B- JP-B- JP-A- KR-B-	578853 6647286 1253939 3689540 0227327 8034502 62164350 9508866	03/11/88 18/06/87 09/05/89 11/05/94 01/07/87 29/03/96 21/07/87 08/08/95
EP-A1- 0602840	02/12/93	CA-A- JP-A-	2107447 6232992	18/06/94 19/08/94

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.